

### Manufacturing Hubs for a Sustainable Future three: invited proposals overview

Eleven Manufacturing Hubs for a Sustainable Future three outlines have been invited through to the full stage opportunity, details are listed below:

| PL Name          | Host organisation         | Proposal title   | Proposal summary   |
|------------------|---------------------------|--|--|
| Niels Lohse      | University of Birmingham  | Co-AIMS: Research Hub on Collaborative AI for Manufacturing Sustainability | The hub will focus on research and commercialisation of AI-empowered autonomous machines and systems to transform manufacturing productivity and sustainability for a net positive future by empowering people. The aim is to deliver leading-edge technologies for robust and safe cognitive, reasoning, autonomous, fault-tolerant, co-operative and cost-effective AI systems and establish a platform for their design, development, assessment and validation.  |
| Nicholas Warrior | University of Nottingham  | EPSRC Future Sustainable Composites Manufacturing Research Hub             | Composites are vital to the UK economy and future renewable energy generation. However, challenges in sustainability and circularity are formidable. The EPSRC Future Sustainable Composites Manufacturing Research Hub will deliver disruptive research breakthroughs by creating new manufacturing methodologies linked with innovative design approaches and material technologies for first- and subsequent-life novel fibre composites to enable the UK composites sector to accelerate composite recycling from current levels of 3% to open loop circularity in 10 years. |
| Suzanne Farid    | University College London | The GreenBioFutures Hub  | The GreenBioFutures Hub will focus on transforming the manufacturing landscape for advanced engineered biologics for a sustainable future.   |
| Svetan Ratchev   | University of Nottingham  | Sustainable Defence Manufacturing Hub                                      | The Hub will deliver a programme of fundamental and transformative research, application studies, training and engagement activities to enable a step change in the long-term sustainability of the UK defence industry in terms of productivity, responsiveness, resource efficiency, low carbon product lifecycle management and dramatic waste reduction.<br>The Hub will create an integrated research and   |

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|                  |                          |   | <p>innovation ecosystem for accelerated development and application of next-generation sustainable defence manufacturing solutions and technologies whilst embedding clear ethical, legal and societal considerations in all activities of the Hub.</p> <p>The long-term results of the Hub will have a significant impact on UK national security and industrial sustainability, help retain unique sovereign design and manufacturing capability and stimulate ethical growth via improved resource utilisation, reduced waste, increased resilience, sustainable in-service support, reuse and remanufacture.</p>   |
| Paul Mativenga   | University of Manchester | Laser Based Innovative Manufacturing for a Sustainable Future | <p>The Hub is dedicated to transforming the UK manufacturing sector through the advancement of cutting-edge laser-material processing approaches. The hub structure will harness the collective expertise of three Universities (Manchester, Loughborough and Heriot-Watt) and The Manufacturing Technology Centre (MTC), leading UK Laser Processing and Sustainable Manufacturing Research Labs and industrial partners to revolutionise UK laser-based manufacturing processes, making them more productive, innovative, efficient, and environmentally friendly.</p>   |
| Stewart Williams | Cranfield University     | Physics based qualification - PhysiQual                       | <p>A major challenge to the introduction of new flexible more environmentally compatible manufacturing processes such as metal additive manufacture (AM) is the high-cost long lead-time and inherent inflexibility of the current statistics-based qualification approach for structural engineering components.</p> <p>Our vision is a physics-materials based flexible rapid, low-cost, digital qualification approach, which is independent of a specific process, component, or system, with qualification being only required once per material type, enabling much wider adoption of modern more adaptable, efficient, and sustainable metal manufacturing processes such as AM.</p> <p>This will be achieved through separation of the physics of energy-material interactions from the system and process engineering, and the implementation of an in-</p> |

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|                 |                           |   | process calibrated, validated, certified intelligent digital monitoring and inspection system.   |
| Keith Ridgway   | University of Strathclyde | Sustainable Manufacture of AeroStructures Hub (SMASH)                       | The Sustainable Manufacture of AeroStructures Hub (SMASH) will drive fundamental research to revolutionise the sustainable manufacture of next-generation aerospace structures. Simultaneously it will accept that with a current backlog in deliveries of around 7 years existing aircraft designs will be in service for the next 25-30 years and can expect one or more through-life refits. In addition to new sustainable design and manufacturing processes the SMASH Hub will carry out research into reusing, refurbishing and recycling components for existing aircraft designs.   |
| Stephen Wallace | University of Edinburgh   | The CarbonLoop Bioinnovation Hub  | The CarbonLoop Hub (C-Loop) will pioneer and accelerate transformative and multidisciplinary engineering biology technologies to valorise carbon embedded within prolific waste streams in the UK. This will create new green industrial biomanufacturing processes that will reduce emissions from existing unavoidable waste disposal processes (landfill and incineration) or as environmental pollution and instead capture and re-enter this as a next-generation carbon resource for sustainable chemical manufacturing in the future circular bioeconomy. Working in close partnership with national scale-up facilities and industrial partners from across the UK waste-to-product value chain, the Hub will address key manufacturing challenges surrounding waste characterisation, microbial upcycling and scale-up currently limiting the uptake of sustainable circular biomanufacturing processes in industry, generating key future engineering biology technologies that will be critical to the UK's path to net-zero. |
| Ton Peijs       | University of Warwick     | EPSRC Sustainable Future Manufacturing Research Hub in Engineering Plastics | The EPSRC Sustainable Future Manufacturing Research Hub in Engineering Plastics aims to revolutionize the plastics sector by enhancing supply chain resilience and promoting innovative, sustainable business models. The  |

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|                         |                           |  | Hub focuses on developing circular materials, sustainable manufacturing processes, and design-for-sustainability approaches specifically tailored for high-value engineering applications. This mission is pursued through five key Research Challenges and three Scale-up & Integration activities, all carried out in close collaboration with industry partners and supported by targeted initiatives in Publicity, Policy, and Engagement.  |
| Gilberto Brambilla      | University of Southampton | Manufacturing research hub in Sustainable Photonics                                | Photonics is the definitive enabling technology, with extraordinary applications that affect nearly every aspect of our lives. Our Hub aims to provide sustainable solutions for a range of photonic applications where there are both sustainability and manufacturing challenges. The main focus will include: Photonics for data centres, PICs and Lidars, Novel optical fibres and related devices, Photonics for space, Lasers and Additive manufacturing, Sources for Environmental sensing and Quantum technologies, Machine learning and AI for photonics.  |
| Cameron Pleydell-Pearce | Swansea University        | IGNITE - Indigenous Green-steel for Net-zero Innovation, Technology and Enterprise | Steel is ubiquitous and underpins the UK's physical fabric and national security. 'If it's not made of steel, it's made using steel'. It supports the products, and enables the services, we use every day whether indigenous or imported. Simply put, our consortium's contributions to date have addressed the industry's own problems via novel technologies, leading to £2.5bn in announced UK investment. The partnership must now move to explore how UK manufacturing can lever this indigenous low CO <sub>2</sub> steel for strategic advantage. IGNITE is a demand driven partnership that uniquely unites the entire steel value chain to overcome co-created scientific challenges and ignite a world leading ferrous circular manufacturing ecosystem in the UK. |

Please contact the EPSRC Manufacturing and the Circular Economy theme with any queries: [manufacturingandce@epsrc.ukri.org](mailto:manufacturingandce@epsrc.ukri.org)